

REMARKS

Claims 1-48 remain pending in the application with claims 42-48 withdrawn from consideration. The independent claims under consideration are claims 1, 15, 28, 32, 37, and 40.

The Examiner rejected claims 1-41 under 35 U.S.C. § 103(a) as being unpatentable over Pazos et al. alone or in view of Mason et al.

The Examiner states the following:

“PAZOS discloses a method for formation of polyether polyols comprising reacting at least one alkylene oxide such as propylene oxide or propylene glycol with continuous addition of starter in the presence of DMC Catalyst (see cols 9-10, Examples 1-2, 3-5).

The disclosure of the reference differs from the instant claims in that it does not disclose the use of an aluminum phosphonate catalyst, as in the claims.

However, the reference does disclose the use of a double metal cyanide catalyst having the same or similar functionality with the claimed aluminum phosphonate catalyst.

Further, MASON does disclose the use of an alkylaluminophosphonate catalyzed ring opening homopolymerization of epichlorin and propylene oxide.

It would have been obvious to one of ordinary skill in the art to use the DMC catalyst, as disclosed in PAZOS, or to use the alkylaluminophosphonate, as disclosed in MASON, to replace said DMC Catalyst, in the claimed method for

formation of polyether polyols, since they have been shown to be effective in a similar system and thus would have been expected to provide adequate results.

There is no showing of unexpected results derived from said use.”

Obviousness cannot be established by combining the teaching of the prior art to produce the claimed invention absent some teaching, suggestion, or motivation that would lead one of ordinary skill in the art to combine the references. *In re Sang Su Lee*, 227 F.3d 1338 (Fed. Cir. 2002), citing *Brown & Williamson Tobacco Corp. v. Phillip Morris, Inc.*, 229 F.3d 1120, 1124-25 (Fed. Cir. 2000); *In re Napier*, 34 U.S.P.Q. 2d 1782 (Fed. Cir. 1995). Elements of separate prior patents cannot be combined when there is no suggestion of such combination anywhere in those patents. *Panduit Corp. v. Dennison Mfg. Co.*, 1 USPQ 2^d 1593 (Fed. Cir. 1987). Virtually all inventions are necessarily combinations of old elements and, thus the notion that combination claims can be declared invalid merely upon the finding of similar elements in separate prior patents would necessarily destroy virtually all patents and cannot be the law under section 103. *Id.* The U.S. Court of Appeals for the Federal Circuit recently made the following statements in *Yamanouchi Pharmaceutical Co., Ltd. v. Danbury Pharmacal, Inc.* 56 USPQ2d 1641, 1644 (Fed. Cir. 2000) concerning the combination of old elements:

"virtually all [inventions] are combinations of old elements". Therefore, an Examiner [or accused infringer] may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate the patentability very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an

examiner [or accused infringer] to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention...To counter this potential weakness in the obvious construction, the suggestion to combine requirements stands as a critical safe guard against hindsight analysis and rote application of the legal test for obviousness." [Emphasis added]

Further, when claimed subject matter has been rejected as being obvious in view of a combination of prior art references a proper analysis under section 103 requires a consideration of two factors: [1] Whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and [2] whether the prior art would also have revealed that, in so making or carry out, those of ordinary skill would have a reasonable expectation of success. *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991), *In re Dow Chemical Company*, 5 USPQ2d 1529 (Fed. Cir. 1988). Both the suggestion and the reasonable expectation of success must be found in the prior art not in the applicant's disclosure. *Id.*

When analyzing the issue of obviousness, the differences between the prior art and the claims that issue must be ascertained. *Graham v. John Deer Co.* 148 USPQ 459, 467 (Sup.Ct.1996). In conjunction with the first three "Graham factors" personal of the US Patent and Trademark Office should: (1) Determine the "scope and content of the prior art"; (2) Ascertain the "differences between the prior art and the claims that issue"; and (3) Determine

the "level of ordinary skill in the art". Official Gazette, 1196 OG 38, March 11, 1997. With respect to the scope and content of the prior art each reference must qualify as prior art under 35 U.S.C. § 102, and should be in the field of the applicant's endeavor or be reasonably pertinent to the particular problem with which the inventor was concerned. *Id.* The mere fact that the prior art can be modified does not make the modification obvious unless prior art taught or suggested the desirability of the modification. *In re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

Obviousness may not be established by hindsight. *Kahn v. General Motors Corp.*, 45 USPQ2d 1608 (Fed. Cir. 1998). Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention. *In re ATD Corp v. Lydal, Inc.*, 48 USPQ2d 1321, 1329 (Fed.Cir.1998). Combining prior art references without evidence of a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability-the essence of hindsight. *In re Dembiczak*, 50 USPQ2d 1614 (Fed. Cir. 1999). The prior art must suggest to one of ordinary skill in the art the desirability of the claimed combination. *In re Fromsom v. Advanced Offset Plate Inc.*, 225 USPQ 26, 31 (Fed. Cir. 1985). Good ideas may well appear "obvious" after they have been disclosed after despite having been previously unrecognized. *In re Arkie Lures, Inc. v. Gene Larew Tackle, Inc.* 43 USPQ2d 1294 (Fed. Cir. 1997).

As a first matter the Examiner has misinterpreted Pazos et al. Propylene glycol as used in Pazos is not an alkylene oxide as suggested by the Examiner, in fact it serves as an initiator in the Pazos disclosed reaction. The Examiner is correct in admitting that Pazos shows no disclosure whatsoever of the aluminum phosphonate catalyst claimed in the present claims. The Examiner is completely wrong in suggesting that Pazos et al. does disclose the use of a double metal cyanide catalyst "having the same or similar functionality with a claimed aluminum phosphonate catalyst". The catalyst as claimed and disclosed in the present invention is completely different from that of a DMC catalyst it has a different functionality; it catalyzes the alkoxylation of the initiator with the alkylene oxide in a different way; and leads to a different product. As noted throughout the present specification and any references regarding DMC catalysts one of ordinary skill in the art would understand that polyols produced using DMC catalysts differ markedly from those same polyols produced using the typical based catalysts such as KOH or even those of the hydroxides of rubidium, cesium, barium, or strontium. Polyether polyols produced using DMC catalyst are not mere dropin replacements for other prior art polyols found using base catalysts. In fact, polyols produced using DMC catalysts require special treatment to remove the DMC catalysts prior to their use in any polyurethane systems. In addition, even after removal of the DMC catalyst, these polyols function in a completely different manner in most polyurethane systems.

As revealed in the present specification, this is one reason why polyether polyols prepared utilizing DMC catalysts have not gained wide spread acceptance within the polyurethane community. One advantage and reason why DMC catalysts have been utilized in

the past is because polyether polyols produced using these catalysts have significantly reduced unsaturation levels. The unsaturation is caused by homopolymerization of alkylene oxides such as propylene oxide. Thus, prior to Applicant's invention the only way to achieve very low unsaturation, higher molecular weight polyether polyols has been through the utilization of DMC catalysts. Such polyether polyols, however, have suffered from the attendant problems noted above with respect to their ability to be incorporated into the standard polyurethane systems. It is only through the Applicant's invention that one is finally able to achieve very low unsaturation polyether polyols of high molecular weight, that can be completely substituted for the prior art base catalyzed polyether polyols with little or no change to the polyurethane system. This is highly unexpected and a significant advance in the art.

Mason et al. discloses use of an alkylaluminum phosphonate catalyst as being useful for **homopolymerization** of either propylene oxide or epichlorohydrin. Homopolymerization means that the reaction contains only the catalyst and the specific alkylene oxide. The product produced is a long chain of repeating alkylene units. Such products are not polyether polyols as required by the present specification. In fact, in the present claims and specification what one is seeking to avoid is homopolymerization of the alkylene oxides as Mason et al. teaches is caused by aluminum phosphonate catalysts. Reading the specification of Mason et al. one would be lead to conclude that use of aluminum phosphonate catalysts may in fact exacerbate the unsaturation problems seen in the oxyalkylation of alkylene oxides onto initiator molecules, which is detrimental to polyurethane systems. Reading the disclosure of Mason et al. one of ordinary skill in the art would not believe that it would be possible to utilize aluminum

phosphonate catalysts to carry out an oxyalkylation reaction as required by the present claims. All of the independent claims of the present application require reaction of at least one alkylene oxide with an initiator molecule in the presence of an aluminum phosphonate catalyst. Suprisingly this enables one to produce polyether polyols of high molecular weight, and very low unsaturation.

The disclosure of Mason et al. would suggest that what would result is homopolymerization of the alkylene oxide leading to the products disclosed in Mason et al. Specifically, Mason et al. discloses that homopolymerization of epichlorohydrin leads to very, very high molecular weight elastomers having molecular weights in excess of 103,000 Daltons. Mason et al. further discloses that in the presence of propylene oxide the catalyst catalyzes formation of homopropylene oxide adducts that are oily and have molecular weights of approximately 3,000 or greater. Neither of these products would find any use in polyurethane systems as disclosed and desired in the present specification.

The catalysts disclosed and claimed in the present specification for use in oxyalkylation reactions are significantly different from the DMC catalyst disclosed in Pazos et al. in a number of other manners as disclosed in the present application on pages 2, 4-5, 14-16 and example 7. Specifically, the present catalyst exhibits no lag time as seen with DMC catalysts, the polyether polyols produced by the present methodologies are specifically drop in replacements for the prior art base catalyzed polyether polyols, and the present catalysts are capable of polymerizing alkylene oxides such as ethylene oxide onto initiators, which is not possible with DMC catalysts. Finally, there is not need to remove the present catalyst from the polyols prior to their

utilization in polyurethane systems, this is completely unlike polyols formed using DMC catalysts.

There is no suggestion in Pazos et al. of utilization of catalysts other than DMC catalysts. There is no teaching or suggestion found within Pazos or Mason et al. that would lead one of ordinary skill in the art to conclude that the catalyst disclosed in Mason et al. could be utilized in an oxyalkylation reaction like that disclosed in Pazos et al. In fact, the disclosure of Mason et al. would teach away from utilization of that catalyst in an oxyalkylation reaction because Mason et al. teaches that the catalyst functions to homopolymerize alkylene oxides, which is undesirable in an oxyalkylation reaction as claimed in the present specification. The method and catalyst disclosed and claimed in the present application is unique and provides a previously unavailable polyether polyol. Namely, one of high molecular weight, with low unsaturation, that can be readily substituted for base catalyzed polyether polyols in polyurethane systems.

In summary, the method claimed in the present claims, all of which require reacting an alkylene oxide with an initiator molecule in the presence of an aluminum phosphonate catalyst, are unique and unexpected in view of the cited prior art. The prior art either alone or in combination fails to make obvious or produce Applicant's invention. Thus, the rejection of the independent claims, and those which depend from them, under 35 U.S.C. § 103(a) based on the cited references is improper and should be withdrawn.



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Applicant's attorney respectfully submits that the claims as amended are now in condition for allowance and respectfully requests such allowance.

Respectfully submitted,

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